इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 249 (1979): Sodium bichromate, technical [CHD 1: Inorganic Chemicals]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS : 249 - 1979
(Reaffirmed 2003)
2010

Indian Standard

SPECIFICATION FOR SODIUM BICHROMATE, TECHNICAL

(Third Revision)

First Reprint MARCH 1999

UDC 661.876.232

© *Copyright* 1980

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 4 *July* 1980

Indian Standard
SPECIFICATION FOR SODIUM BICHROMATE, TECHNICAL
(Third Revision)

Inorganic Chemicals (Misc) Sectional Committee, CDC 3

Chairman	*Representing*
Dr M. S. Vaidya	Dharamsi Morarji Chemical Co Ltd, Bombay
Members	
Shri H. T. Kapadia (*Alternate* to Dr M. S. Vaidya)	
Shri B. N. Bhattacharyya	Geological Survey of India, Calcutta
Shri A. K. Bose	Directorate General of Technical Development, New Delhi
Shri R. C. Bhattacharya (*Alternate*)	
Shri S. K. Chakraborty	Development Commissioner, Small Scale Industries, New Delhi
Shri S. S. Honavar	Italab Private Ltd, Bombay
Shri J. C. Dey (*Alternate* I)	
Shri M. V. Dabholkar (*Alternate* II)	
Shri H. H. Kavarana	Sarabhai M. Chemicals Ltd, Vadodara
Shri J. K. Patwa (*Alternate*)	
Shri R. Prabhakar	Tata Chemicals Ltd, Bombay
Shri N. B. Patel (*Alternate*)	
Shri A. K. Rao	D.C.M. Chemical Works, New Delhi
Shri D. V. N. Shastry (*Alternate*)	
Shri B. K. Sachar	Ministry of Defence (R & D)
Shri A. D. Gupta (*Alternate*)	
Dr E. R. Saxena	Regional Research Laboratory (CSIR), Hyderabad
Dr Md. Zafar Jamil (*Alternate*)	
Shri D. C. Shah	Kesar Sugar Works Ltd, Bombay
Shri H. C. Shah	Golden Chemicals Pvt Ltd, Bombay
Shri L. H. Thakkar (*Alternate*)	
Shri Y. V. Shetty	Indian Oil Corporation Ltd (Refineries and Pipelines Division), New Delhi
Shri S. B. Shukla	Basic Chemicals, Pharmaceuticals and Soaps Export Promotion Council, Bombay

(Continued on page 2)

© *Copyright* 1980
BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
Dr V. Srinivasan	Glaxo Laboratories (India) Ltd, Bombay
Dr J. V. Vora (*Alternate*)	
Shri S. Subbiah	Directorate General of Supplies & Disposals, New Delhi
Dr Surjit Singh	Ministry of Defence (DGI)
Shri J. A. Asthaputre (*Alternate*)	
Shri N. C. Thakkar	Indian Chemical Manufacturers' Association, Calcutta
Dr G. M. Saxena, Director (Chem)	Director General, ISI (*Ex-officio Member*)

Secretary

Shri N. K. Sharma
Deputy Director (Chem), ISI

Auxiliary Chemicals Subcommittee, CDC 3 : 18

Convener	
Dr M. S. Vaidya	Dharamsi Morarji Chemical Co Ltd, Bombay
Members	
Shri O. L. Duggal	Indian Paper Makers' Association, Calcutta
Shri N. K. Guha	Development Commissioner, Small Scale Industries, New Delhi
Shri M. M. Kaul	Khosla Metal Powders Ltd, Pune
Shri S. P. Khosla (*Alternate*)	
Shri M. A. Kotibhaskar	Phoenix Chemical Works Pvt Ltd, Bombay
Shri M. A. Chunekar (*Alternate*)	
Shri U. V. Kunikullaya	Tamil Nadu Chromates & Chemicals Ltd, Madras
Shri M. N. Kini (*Alternate*)	
Shri M. G. Menon	The Travancore Cochin Chemicals Ltd, Alwaye (Kerala)
Shri C. N. G. Nair (*Alternate*)	
Shri S. V. Nayak	J. K. Chemicals Ltd, Thane
Shri P. A. Menon (*Alternate*)	
Shri N. B. Patel	Tata Chemicals Ltd, Bombay
Shri T. R. Rao (*Alternate*)	
Shri J. K. Patwa	Sarabhai M. Chemicals Ltd, Vadodara
Shri H. H. Kavarana (*Alternate*)	
Shri D. C. Shah	Kesar Sugar Works Ltd, Bombay
Shri H. C. Shah	Golden Chemicals Pvt Ltd, Bombay
Shri L. H. Thakkar (*Alternate* I)	
Shri Y. M. Rawal (*Alternate* II)	
Shri K. M. Shah	The Millowners' Association, Bombay

Indian Standard
SPECIFICATION FOR
SODIUM BICHROMATE, TECHNICAL
(Third Revision)

0. FOREWORD

0.1 This Indian Standard (Third Revision) was adopted by the Indian Standards Institution on 15 May 1979, after the draft finalized by the Inorganic Chemicals (Misc) Sectional Committee had been approved by the Chemical Division Council.

0.2 Sodium bichromate is used for tanning leather and for making chrome pigments by interaction with other salts. It also finds wide use in metal treatment for cleaning and producing corrosion-resistant films, to retard corrosion in refrigeration brines, air washers, condensers, automobiles, boilers, etc. In the textile industry, sodium bichromate is used in mordanting, dyeing and the manufacture of dyes. Other applications of sodium bichromate are in bleaching and purification of oils and fats, photography, wood preservation, adhesives and organic synthesis and manufacture of other chromium compounds.

0.3 This standard was originally published in 1951. In the first revision, sodium bichromate content was raised to 98·5 percent and the limits of impurities of sulphates and calcium compounds and the limit of free and combined water were reduced. In the second revision, requirements of matter insoluble in water and *p*H were added in order to ensure absence of chromate in the bichromate. In the present revision the limit of sodium bichromate has been further upgraded to 99·0 percent, and the limit for moisture has been changed to 13·0 percent.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for sodium bichromate, technical.

---

*Rules for rounding off numerical values (*revised*).

2. REQUIREMENTS

2.1 Description — Sodium bichromate, technical, shall be in the form of orange red, non-caking crystals, free from foreign matter and visible impurities, and shall form a clear solution when dissolved in water.

NOTE — *The material may form lumps if packed in gunny bags.*

2.2 The material shall comply with the requirements given in Table 1 when tested according to the methods prescribed in Appendix A. Reference to the relevant clauses of Appendix A is given in col 4 of the table.

TABLE 1 REQUIREMENTS FOR SODIUM BICHROMATE, TECHNICAL

SL NO.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO CL NO. IN APPENDIX A
(1)	(2)	(3)	(4)
i)	Free moisture and combined water, percent by mass, *Max*	13·0	A-2
ii)	Sodium bichromate (as $Na_2Cr_2O_7$) content, percent by mass, *Min*	99·0	A-3
iii)	Sulphates (as Na_2SO_4), percent by mass, *Max*	0·65	A-4
iv)	Chlorides (as NaCl), percent by mass, *Max*	0·50	A-5
v)	Calcium compounds (as $CaSO_4$), percent by mass, *Max*	0·15	A-6
vi)	Matter insoluble in water, percent by mass, *Max*	0·05	A-7
vii)	*p*H value (of aqueous solution)	3·7 to 4·3	A-8

NOTE — Requirements against Sl No. (ii) to (vi) are on dry basis.

3. PACKING AND MARKING

3.1 Packing — The material shall be packed as agreed to between the purchaser and the supplier.

3.2 Marking — The packages shall be securely closed and marked with the following information:

a) Name and grade (technical) of the material;
b) Name of the manufacturer and his recognized trade-mark, if any;
c) Gross and net mass;
d) Date of manufacture; and
e) Batch number.

3.2.1 The product may also be marked with Standard mark.

3.2.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

4. SAMPLING

4.1 Representative samples of the material shall be drawn and the conformity of the material to the requirements of this specification shall be determined in accordance with the procedure prescribed in Appendix B.

APPENDIX A

(*Clause* 2.2)

METHODS OF TEST OF SODIUM BICHROMATE, TECHNICAL

A-1. QUALITY OF REAGENTS

A-1.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977*) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-2. FREE MOISTURE AND COMBINED WATER

A-2.1 Procedure — Weigh accurately about 25 g of the material in a petri dish of about 10 cm diameter. Heat at 150 ± 1°C for one hour. When completely dried, cool in a desiccator and weigh. Repeat this operation till constant mass is obtained. Use this dried material for subsequent analysis.

A-2.2 Calculation

$$\text{Free moisture and combined water, percent by mass} = 100 \times \frac{M_1}{M_2}$$

where

M_1 = loss in mass in g, and

M_2 = mass in g of the material taken for the test.

---

*Specification for water for general laboratory use (*second revision*).

A-3. SODIUM BICHROMATE

A-3.0 Two methods are prescribed, namely, (a) Iodometric method, and (b) Permanganate method. Any one of them may be used.

A-3.1 Iodometric Method

A-3.1.1 *Reagents*

A-3.1.1.1 *Potassium iodide* — crystals.

A-3.1.1.2 *Dilute sulphuric acid* — 1 : 3 (*v/v*).

A-3.1.1.3 *Standard sodium thiosulphate solution* — 0·1 N, freshly standardized.

A-3.1.1.4 *Starch solution* — Triturate 5 g of starch and 0·01 g of mercuric iodide with 30 ml of water in a mortar. Pour the resulting paste into one litre of boiling water, boil for 3 minutes, allow the solution to cool, and decant off the clear liquid.

A-3.1.2 *Procedure* — Weigh accurately about 2 g of the dried sample (*see* **A-2.1**) and dissolve it in 50 ml of water. Make up the solution to 250 ml. Transfer accurately 25 ml of the solution to a 250-ml glass stoppered flask, and add 4 to 5 g of potassium iodide and dissolve by shaking. Add 10 ml of dilute sulphuric acid and let stand in dark for 10 minutes. Titrate the liberated iodine with standard sodium thiosulphate solution, using about 5 ml of starch solution towards the end, until the blue colour produced just disappears. One millilitre of 0·1 N sodium thiosulphate solution is equivalent to 0·004 37 g of sodium bichromate ($Na_2Cr_2O_7$).

A-3.1.3 *Calculation*

$$\text{Sodium bichromate (as } Na_2Cr_2O_7 \text{), percent by mass} = \frac{43{\cdot}7\,N\,V}{M}$$

where

N = normality of standard sodium thiosulphate solution,

V = volume in ml of standard sodium thiosulphate solution used in the titration, and

M = mass in g of the material taken for the test.

A-3.2 Permanganate Method

A-3.2.1 *Reagents*

A-3.2.1.1 *Ferrous ammonium sulphate solution* — 0·1 N.

A-3.2.1.2 *Standard potassium permanganate solution* — 0·1 N.

A-3.2.2 *Procedure* — Weigh accurately about 2 g of the dried sample (*see* **A-2.1**) and dissolve in 50 ml of water. Make up to exactly 250 ml with water in a volumetric flask. Pipette out 25 ml of the solution in a conical flask and add to it 50 ml of ferrous ammonium sulphate solution. Mix well, add 25 ml of water and titrate against standard potassium permanganate solution till the colour changes at the end point from green to grey. Carry out a blank titration with 50 ml of ferrous ammonium sulphate solution against standard potassium permanganate solution. One millilitre of 0·1 N potassium permanganate solution is equivalent to 0·004 37 g of sodium bichromate ($Na_2Cr_2O_7$).

A-3.2.3 *Calculation*

$$\text{Sodium bichromate (as } Na_2Cr_2O_7\text{), percent by mass} = \frac{(V_1 - V_2)\, N \times 43{\cdot}7}{M}$$

where

V_1 = volume in ml of potassium permanganate solution required for the blank titration,

V_2 = volume in ml of potassium permanganate solution required for the material,

N = normality of standard potassium permanganate solution, and

M = mass in g of the material taken for the test.

A-4. SULPHATES

A-4.1 Reagents

A-4.1.1 *Concentrated Hydrochloric Acid* — *See* IS : 265-1976*.

A-4.1.2 *Rectified Spirit* — 95 percent (by volume) (*see* IS : 323-1959†).

A-4.1.3 *Barium Chloride Solution* — approximately 10 percent (*m/v*).

A-4.1.4 *Dilute Hydrochloric Acid* — approximately one percent (*v/v*).

A-4.1.5 *Concentrated Sulphuric Acid* — *see* IS : 266-1977‡.

A-4.1.6 *Concentrated Nitric Acid* — *see* IS : 264-1976§.

A-4.2 Procedure — Weigh accurately about 5 g of the dried sample (*see* **A-2.1**) and dissolve in 20 ml of water. Filter, if necessary, into a 250-ml beaker. Add to the solution or filtrate 35 ml of concentrated hydrochloric

---

*Specification for hydrochloric acid (*second revision*).

†Specification for rectified spirit (*revised*).

‡Specification for sulphuric acid (*second revision*).

§Specification for nitric acid (*second revision*).

acid and 25 ml of rectified spirit. Boil until all the chromate is reduced to the green trivalent form. Dilute the solution to 150 ml with water, heat to boiling and add slowly 20 ml of hot barium chloride solution. Continue boiling for 15 minutes, and allow it to stand for 4 hours. Filter the solution containing barium sulphate through a tared Gooch crucible or a filter paper (Whatman No. 42 or equivalent). Wash with dilute hydrochloric acid till it is free from chromium salts and then with water till it is free from chlorides. Ignite the precipitate at 600 to 700°C. Cool and add 2 drops of concentrated nitric acid and 2 drops of concentrated sulphuric acid and gently heat to drive off acid fumes. Then ignite again till constant mass is obtained.

A-4.2.1 Excess of barium chloride is necessary to reduce the solubility of barium sulphate. Precipitation in hot solution by addition of barium chloride in a slow stream with stirring minimizes mechanical occlusion of barium chloride and gives a coarse precipitate which is less soluble in acids.

A-4.3 Calculation

$$\text{Sulphate (as } Na_2SO_4 \text{), percent by mass} = \frac{60{\cdot}86\, M_1}{M}$$

where

M_1 = mass in g of the ignited precipitate, and

M = mass in g of the material taken for the test.

A-4.3.1 Obtain sulphate as in **A-4.3**, (X), and calcium as in **A-6.3**. Equate the calcium with the sulphate required by it, (Y). Then ($X - Y$) will represent the sulphate combined with sodium. Calculate the sodium sulphate quantity from this figure.

A-5. CHLORIDES

A-5.1 Reagents

A-5.1.1 *Calcium Carbonate* — solid.

A-5.1.2 *Standard Silver Nitrate Solution* — 0·1 N.

A-5.1.3 *Potassium Chromate Indicator Solution* — Dissolve 5 g of potassium chromate in 100 ml of water.

A-5.2 Procedure — Weigh accurately about 5 g of the dried material (*see* **A-2.1**) and transfer into a 250-ml conical flask. Add about 4 g of calcium carbonate to neutralize it and shake well. Titrate with standard silver nitrate solution to the end point to give a permanent brown precipitate or red colour.

A-5.2.1 Carry out a blank with 4 g of calcium carbonate in 50 ml of water, using potassium chromate indicator.

A-5.3 Calculation

$$\text{Chlorides (as NaCl), percent by mass} = \frac{(V_1 - V_2)\,N \times 5\cdot85}{M}$$

where

V_1 = volume in ml of standard silver nitrate solution used in the titration with the material,

V_2 = volume in ml of standard silver nitrate solution used in the blank determination,

N = normality of standard silver nitrate solution, and

M = mass in g of the material taken for the test.

A-6. CALCIUM COMPOUNDS

A-6.1 Reagents

A-6.1.1 *Ammonium Oxalate Solution* — saturated.

A-6.1.2 *Methyl Red Indicator Solution* — Dissolve 0·15 g of methyl red in water and dilute the solution to 500 ml.

A-6.1.3 *Dilute Ammonium Hydroxide* — approximately 5 N and 0·5 N.

A-6.1.4 *Dilute Sulphuric Acid* — 1 : 4 (by volume).

A-6.1.5 *Standard Potassium Permanganate Solution* — 0·1 N.

A-6.2 Procedure — Weigh accurately about 5 g of the dried sample (*see* **A-2.1**) and dissolve in 50 ml of water. Filter, if necessary. Heat the filtrate and washings to boiling and add, with constant stirring, an excess of hot ammonium oxalate solution. Add 2 to 3 drops of methyl red indicator and to the hot solution maintained at 70 to 80°C add, with constant stirring, dilute ammonium hydroxide (5 N) dropwise, until the colour changes from red to yellow. Allow the solution to stand at 70 to 80°C for one hour, and then filter through a filter paper (Whatman No. 40 or its equivalent). Test the filtrate for the presence of calcium with ammonium oxalate solution before throwing it away. Wash the precipitate a few times with dilute ammonium hydroxide (0·5 N) until it is free from oxalates. Pierce the apex of the filter with a stirring rod, and wash the bulk of the precipitate through the funnel into a conical flask with hot water. Then wash the filter paper a few times with warm dilute sulphuric acid. Finally wash the filter paper thoroughly with hot water. Add about 30 ml of dilute sulphuric acid to the washings, dilute to 250 ml, heat to 60°C and titrate while hot with standard potassium permanganate solution.

A-6.3 Calculation

$$\text{Calcium (as CaSO}_4\text{), percent by mass} = \frac{6\cdot807\,V\,N}{M}$$

where

V = volume in ml of standard potassium permanganate solution required for the titration,

N = normality of the standard potassium permanganate solution, and

M = mass in g of the material taken for the test.

A-7. MATTER INSOLUBLE IN WATER

A-7.1 Procedure — Weigh accurately about 10 g of the dried material (*see* **A-2.1**) and dissolve in 100 ml of water. Heat on a water-bath for 30 min. Filter the solution through a tared sintered glass crucible. Wash the residue, if any, with hot water and dry to constant mass at 105 to 110°C.

A-7.2 Calculation

$$\text{Matter insoluble in water, percent by mass} = 100 \times \frac{M_1}{M_2}$$

where

M_1 = mass in g of the residue, and

M_2 = mass in g of the material taken for the test.

A-8. *p*H VALUE

A-8.1 Apparatus

A-8.1.1 *pH Meter* — a suitable *p*H meter fitted with glass and calomel electrodes.

A-8.2 Procedure — Weigh 5·0 g of the material in a beaker, add 50 ml of freshly boiled and cooled water and stir to dissolve. Measure the *p*H of the solution with the help of *p*H meter.

APPENDIX B

(*Clause* 4.1)

SAMPLING OF SODIUM BICHROMATE, TECHNICAL

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling samples, the following precautions shall be observed.

B-1.1 Samples shall not be taken in an exposed place.

B-1.2 The sampling instrument shall be clean and dry.

B-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.4 To draw a representative sample, the contents of each container selected for sampling shall be mixed thoroughly by suitable means.

B-1.5 The samples shall be placed in clean, dry and air-tight glass or other suitable containers on which the material has no action.

B-1.6 The sample containers shall be of such a size that they are almost but not completely filled with the sample.

B-1.7 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling, the year of manufacture and other important particulars of the consignment.

B-2. SCALE OF SAMPLING

B-2.1 Lot — All the containers in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture, the containers belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

B-2.1.1 Samples shall be tested from each lot for ascertaining conformity of the material to the requirements of the specification.

B-2.2 The number of containers (n) to be chosen from a lot shall depend on the size of the lot (N) and shall be in accordance with Table 2.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

LOT SIZE (N) (1)	NUMBER OF CONTAINERS TO BE SELECTED (n) (2)
3 to 50	3
51 ,, 200	4
201 ,, 400	5
401 ,, 650	6
651 and above	7

B-2.3 The containers to be selected for sampling shall be chosen at random from the lot and for this purpose random number tables shall be used. In case such tables are not available, the following procedure may be adopted:

> Starting from any container, count them in one order as 1, 2, 3......, up to r and so on, where r is the integral part of N/n. Every rth container thus counted shall be taken out.

B-3. TEST SAMPLES AND REFEREE SAMPLE

B-3.1 Preparation of Test Samples and Referee Sample

B-3.1.1 Draw with an appropriate sampling instrument a small portion of the material from different parts of each container selected for sampling. The total quantity of the material drawn from each container shall be sufficient to conduct the tests for all the characteristics given under **2**.

B-3.1.2 Thoroughly mix all portions of the material drawn from the same container. Out of these portions a small but equal quantity shall be taken from each selected container and shall be well mixed up together so as to form a composite sample weighing not less than 300 g. This composite sample shall be divided into three equal parts, one for the purchaser, the second for the supplier and the third to be used as referee sample.

B-3.1.3 The remaining portion of the material from each container (after a small quantity needed for the formation of composite has been taken out) shall be divided into three equal parts, each part weighing not less than 10 g. These parts shall be immediately transferred to thoroughly dried bottles which are then sealed air-tight with stoppers and labelled with all the particulars of sampling given in **B-1.7**. The material in each such sealed bottle shall constitute an individual test sample. These individual samples shall be separated into three identical sets of samples in such a way that each set has an individual test sample representing each container selected. One of these three sets shall be for the purchaser, the second for the supplier and the third shall be used as referee sample.

B-3.2 The referee sample consisting of the composite sample (*see* **B-3.1.2**) and a set of individual samples (*see* **B-3.1**) shall be marked for this purpose and shall bear the seals of the purchaser and the supplier. It shall be kept at a place agreed to between the purchaser and the supplier and shall be used in case of dispute between the two.

B-4. NUMBER OF TESTS

B-4.1 Tests for the determination of sodium bichromate shall be conducted on each of the individual samples constituting the set of test sample.

B-4.2 Tests for the remaining characteristics shall be conducted on the composite sample.

B-5. CRITERIA FOR CONFORMITY

B-5.1 For Individual Samples — The mean and the range of the test results for the determination of sodium bichromate shall be calculated as follows :

Mean ($\overline{X}$) = The sum of the test results divided by the number of test results, and

Range (R) = The difference between the maximum and the minimum values of the test results.

B-5.1.1 If ($\overline{X} - 0{\cdot}6\ R$) is equal to or greater than the minimum requirement of sodium bichromate, the lot shall be declared to have satisfied the requirement for sodium bichromate.

B-5.2 For Composite Sample — The test results on the composite sample shall meet the corresponding requirements specified in **2**.

B-5.3 A lot shall be declared as conforming to this specification if it satisfies the requirements for each of the characteristics listed in **2**.

B-5.4 If the requirement for any of the characteristics are not met, the lot shall be declared to have not satisfied the requirements of this specification.

BUREAU OF INDIAN STANDARDS

Headquarters:
Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
Telephones: 323 0131, 323 3375, 323 9402 **Fax** :+ 91 11 3234062, 3239399, 3239382
E - mail : bisind @ del 2.vsnl.net.in **Internet** : http://wwwdel.vsnl.net.in/bis.org

Central Laboratory:	***Telephone***
Plot No. 20/9, Site IV, Sahibabad Industrial Area, Sahibabad 201010	91-77 00 32
Regional Offices:	
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	323 76 17
*Eastern : 1/14 CIT Scheme VII, V.I.P. Road, Kankurgachi, CALCUTTA 700054	337 86 62
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113	235 23 15
†Western : Manakalaya, E9, MIDC, Behind Marol Telephone Exchange, Andheri (East), MUMBAI 400093	832 92 95
Branch Offices:	
'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001	550 13 48
‡Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road, BANGALORE 560058	839 49 55
Commercial-cum-Office Complex, Opp. Dushera Maidan, Arera Colony, Bittan Market, BHOPAL 4620160	72 34 52
62/63, Ganga Nagar, Unit VI, BHUBANESHWAR 751001	40 36 27
Kalai Kathir Building, 670 Avinashi Road, COIMBATORE 641037	21 01 41
Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001	91-28 88 01
Savitri Complex, 116 G.T. Road, GHAZIABAD 201001	91-71 19 98
53/5 Ward No.29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003	56 65 08
5-8-56C, L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001	320 10 84
E-52, Chitaranjan Marg, C- Scheme, JAIPUR 302001	37 38 79
117/418 B, Sarvodaya Nagar, KANPUR 208005	21 68 76
Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226005	21 89 23
NIT Building, Second Floor, Gokulpat Market, NAGPUR 440010	52 51 71
Patliputra Industrial Estate, PATNA 800013	26 28 08
Institution of Engineers (India) Building 1332 Shivaji Nagar, PUNE 411005	32 36 35
'Sahajanand House' 3rd Floor, Bhaktinagar Circle, 80 Feet Road, RAJKOT 360002	26 85 86
T.C. No. 14/1421, University P. O. Palayam, THIRUVANANTHAPURAM 695034	32 72 15

---

*Sales Office is at 5 Chowringhee Approach, P.O. Princep Street, CALCUTTA 700072	27 10 85
†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007	309 65 28
‡Sales Office is at 'F' Block, Unity Building, Narashimaraja Square, BANGALORE 560002	222 39 71

Printed at : Prabhat Offset Press, New Delhi-2